

# HSC106D

## Sensitive Gate Silicon Controlled Rectifier

$$V_{DRM} = 400 \text{ V}$$

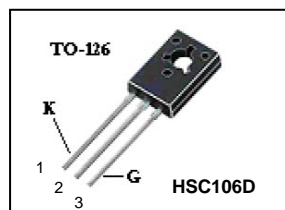
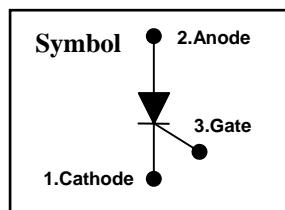
$$I_{T(RMS)} = 4.0 \text{ A}$$

### FEATURES

- ❑ Repetitive Peak Off-State Voltage ( $V_{RM}=400\text{V}$ )
- ❑ R.M.S On-state Current ( $I_{T(RMS)}=4.0\text{A}$ )
- ❑ Average On-state Current ( $I_{T(AV)}=2.55\text{A}$ )
- ❑ Sensitive Gate Triggering ( $0.2\text{mA}_{Max}$  @  $25^\circ\text{C}$ )

### General Description

Glassivated PNP devices designed for high volume consumer applications such as temperature, light and speed control ; process and remote control, and warning systems where reliability of operation is important.



### Absolute Maximum Ratings ( $T_J=25^\circ\text{C}$ )

Symbol	Parameter	Value	Units
$V_{DRM}$	Repetitive Peak Off-State Voltage (Forward)	400	V
$V_{RRM}$	Repetitive Peak Off-State Voltage (Reverse)	400	V
$I_{T(RMS)}$	On-State R.M.S Current ( $180^\circ$ Condition Angles, $T_C=80^\circ\text{C}$ )	4.0	A
$I_{T(AV)}$	On-State Average Current ( $180^\circ$ Condition Angles, $T_C=80^\circ\text{C}$ )	2.55	A
$I_{TSM}$	Surge On-State Current (1/2 Cycle, 60Hz, Sine Wave, Non-repetitive, $T_j = 110^\circ\text{C}$ )	20	A
$I^2t$	Circuit Fusing Considerations ( $t=8.3\text{mS}$ )	1.65	$\text{A}^2\text{s}$
$P_{GM}$	Forward Peak Gate Power Dissipation (Pulse Width $\leq 1.0\mu\text{sec}$ , $T_C=80^\circ\text{C}$ )	0.5	W
$P_{G(AV)}$	Forward Average Gate Power Dissipation (Pulse Width $\leq 1.0\mu\text{sec}$ , $T_C=80^\circ\text{C}$ )	0.1	W
$V_{GRM}$	Reverse Peak Gate Voltage	6.0	V
$I_{FGM}$	Forward Peak Gate Current (Pulse Width $\leq 1.0 \mu\text{sec}$ , $T_C=80^\circ\text{C}$ )	0.2	A
$T_{STG}$	Storage Temperature Range	-40 to +150	$^\circ\text{C}$
$T_j$	Operating Junction Temperature	-40 to +110	$^\circ\text{C}$

**Electrical Characteristics** ( $T_a=25^\circ\text{C}$ )

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$I_{GT}$	Gate Trigger Current <sup>(1)</sup>	$V_{AK}=6\text{VDC}, R_L=100\Omega, T_J=25^\circ\text{C}$ $V_{AK}=6\text{VDC}, R_L=100\Omega, T_J=-40^\circ\text{C}$		15 35	200 500	$\mu\text{A}$
$V_{GT}$	Gate Trigger Voltage <sup>(1)</sup>	$V_{AK}=6\text{VDC}, R_L=100\Omega, T_J=25^\circ\text{C}$ $V_{AK}=6\text{VDC}, R_L=100\Omega, T_J=-40^\circ\text{C}$	0.4 0.5	0.6 0.75	0.8 1.0	V
$V_{GD}$	Non Trigger Gate Voltage	$V_{AK}=12\text{VDC}, R_L=100\Omega, T_C=110^\circ\text{C}$	0.2			V
$I_H$	Holding Current	$V_{AK}=12\text{VDC}$ , Gate open, Initiating current=20mA, $T_J=25^\circ\text{C}$ $T_J=-40^\circ\text{C}$ $T_J=110^\circ\text{C}$		0.19 0.33 0.07	3.0 6.0 2.0	mA
$I_L$	Latching Current	$V_{AK}=12\text{VDC}, I_G=20\text{mA}$ , Gate Open, $T_J=25^\circ\text{C}$ $T_J=110^\circ\text{C}$		0.2 0.35	5.0	mA
$I_{DRM}$ $I_{RRM}$	Repetitive or Reverse Peak Blocking Current	$V_{AK}=V_{DRM}$ or $V_{RRM}$ , $T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$			10 100	$\mu\text{A}$ $\mu\text{A}$
$V_{TM}$	Peak Forward On-State Voltage <sup>(2)</sup>	$I_{FM}=1\text{A}$			2.2	V
dv/dt	Critical Rate of Rise Off state Voltage	$V_{AK}=V_{DRM}$ , Exponential waveform, $R_{GK}=1\text{k}\Omega$ , Gate open, $T_J=110^\circ\text{C}$		8.0		V/ $\mu\text{S}$

<sup>(1)</sup>  $R_{GK}$  Current is not included in measurement

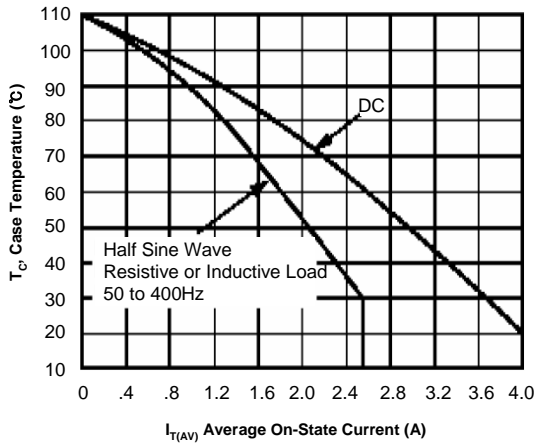
<sup>(2)</sup> Pulse Test : Pulse width  $\leq 2.0\text{mS}$ , Duty Cycle  $\leq 2\%$

**Thermal Characteristics**

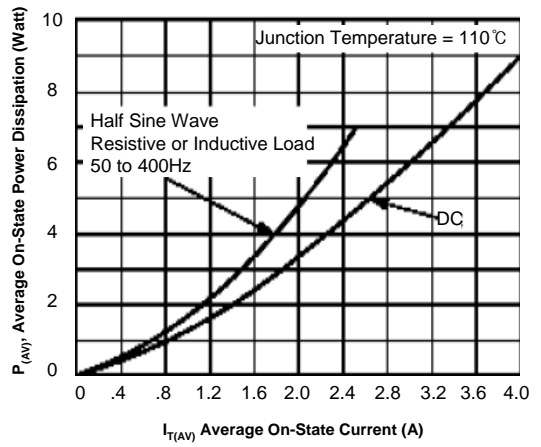
Symbol	Parameter	Conditions	Min	Typ	Max	Units
$R_{TH(J-C)}$	Thermal Resistance	Junction to Case			3.0	$^\circ\text{C}/\text{W}$
$R_{TH(J-A)}$	Thermal Resistance	Junction to Ambient			75	$^\circ\text{C}/\text{W}$
TL	Maximum Lead Temperature for Soldering Purpose 1/8", from case for 10second				260	$^\circ\text{C}$

# Performance Curves

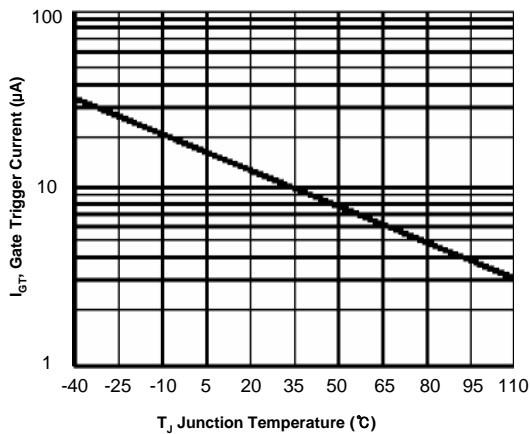
**Fig 1. Average Current Derating**



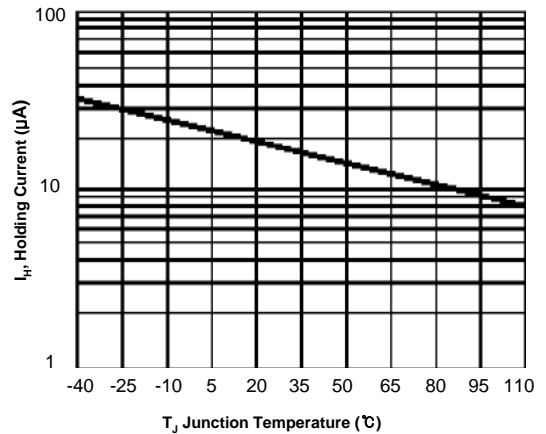
**Fig 2. Maximum On-State Power Dissipation**



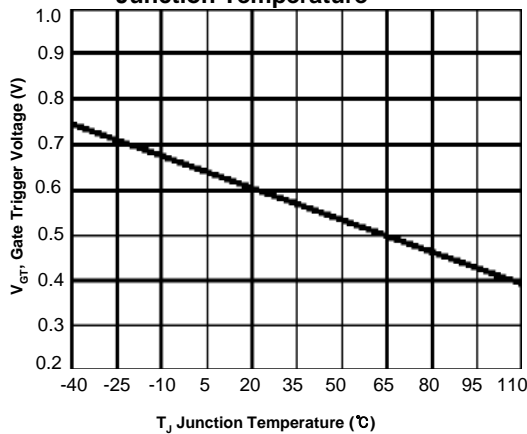
**Fig 3. Typical Gate Trigger Current vs Junction Temperature**



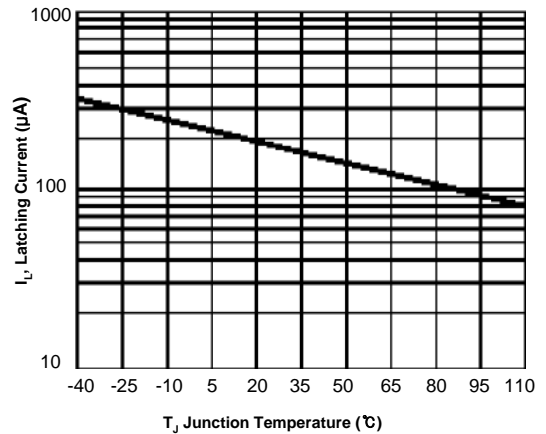
**Fig 4. Typical Holding Current vs Junction Temperature**



**Fig 5. Typical Gate Trigger Voltage vs Junction Temperature**

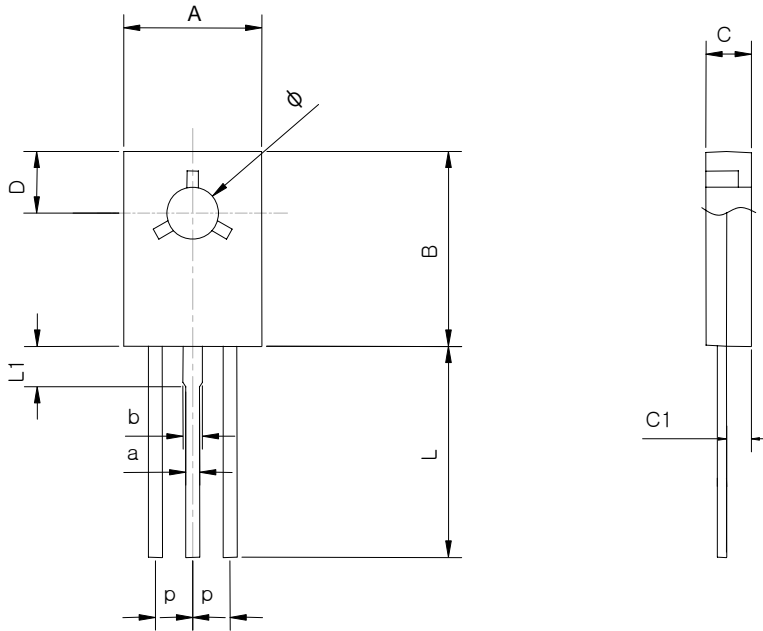


**Fig 6. Typical Latching Current vs Junction Temperature**



Package Dimension

HSC106D  
(TO-126)



Dimension Table

Unit :[ mm]

Symbol	Dimension		Symbol	Dimension	
	Min	Max		Min	Max
A	-	8.5	L1	2.3	2.7
B	-	12.0	$\phi$	3.0	3.4
C	-	2.8	a	0.7	0.86
C1	1.27 Typ		b	1.2 Typ	
D	3.6	4.0	p		2.3
L	-	13.0			